DOCUMENT RESUME

ED 228 785 EC 151 639

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TITLE [North Carolina Gifted and Talented Minigrant Curriculum Projects: Two Biology Projects].
INSTITUTION Durham City Schools, N.C.
PUB DATE 82
NOTE 10p.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Biology; *Ecology; *Entomology; *Gifted; High Schools; Junior High Schools; Learning Activities; Lesson Plans; *Secondary School Science; *Talent; Units of Study

ABSTRACT

Overviews of two biology units for junior and senior high school gifted and talented students are presented. The Durham North Carolina City School units are entitled, "The Identification, Collection, and Control of the Japanese Beetle through the Growth of Roses and Lawn Care" and "Treasure along the Nantahala River." The first, an entomology unit for seventh and eighth grade students with a basic knowledge of science, is outlined in terms of learning activities, research paper topics, laboratory experiences, and materials and equipment. A sample laboratory lesson plan is presented, which includes objectives, assignments, and required readings. Lists of expenditures and references for the entomology study unit are also provided. The second biology unit, for 10th grade, is used in conjunction with an ecological investigation of the Appalachian mountain area. The unit is outlined in terms of the overall purpose; specific objectives; the plan of action; student activities before, during, and after the field trip; and the evaluation of students. Objectives of the ecology unit include: developing appreciation of the biological significance of the river area; learning how biology is related to many disciplines; learning to distinguish right and left brain thought patterns; and recognizing the personalities and talents of other participants. (SEW)

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[North Carolina Gifted and Talented Minigrant Curriculum Projects: Two Biology Projects]

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February 18, 1981

Gifted and Talented Minigrant for Curriculum Development In Entomology

Title: The Identification, Collection and Control of the Japanese Beetle through the growth of roses and lawn care.

Location of Project: The project site involved two junior high schools where classes are organized for gifted pupils, grades 7 and 8.

Competencies: Participating pupils were selected from the gifted population and will be required to have a basic knowledge of science. The participants mastered the identification and collection process relative to the Control of the Japanese Beetle. Participating pupils were required to organize his/her research and write one research paper as required and encouraged to become specialists as a result of this project.

Activities: The activities included the maximum use and care of equipment during the collection process, where to look, when to look, and what to do. The pupils were required to participate in field trips to appropriate agencies, write research papers, read selected books, and study rose and lawn care. The rose beds were prepared in December and roses were planted in February.

Research Topics:

1. How do insects recognize one another?
2. How much does a caterpiller eat?
3. Can a Japanese Beetle recognize color?
4. What colors are rejected by Japanese Beetles?
5. Field and life - history studies of the Japanese Beetle.
6. The family tree of the Japanese Beetle.
7. The adaption and feeding habits of the Japanese Beetle.
8. When are Japanese Beetles destructive?
9. How can an entire community be treated?

Laboratory Experiences: A microscopic study of the Japanese Beetle and specific body parts will be strongly emphasized. Spray materials and lawn treatment materials were examined and discussed as a laboratory experience.

Materials: The spray program for roses and plants where Japanese Beetles are found will involve use of the folling during the summer months:

1. Benomyl
2. Phaltan
3. Orthene
4. Sevin Dust
5. Milky Spore

Other needed materials and equipment will include rose bushes, fertilizer, spray pump, beetle traps, rose shears, and magnifying glass.

Transportation: Participants will be transported to neighboring agencies where Entomology Departments are organized.

Sample Laboratory Lesson Plan
December 15-19, 1980

Objectives:

1. To locate the homes of Japanese Beetles.
2. To examine the microscopic structure of the Japanese Beetle.
3. To scientifically examine the four distinct developmental stages of the Japanese Beetle.
4. To observe the complete metamorphic stages of the Japanese Beetle including description and habits.

Field Trips:

During the field trip, participants will collect Japanese Beetles in the larva stages during this time of year in order to develop the above objectives.

Laboratory Assignments:

Participants will be required to examine their collection which involves drawings, labels of body parts, function of body parts, and metamorphic stages.

Required Readings:

1. Japanese Beetles develop through four distinct stages, A Golden Guide - Insects Pest. Golden Press, N.Y., pages 9-10.

2. Japanese Beetles and Lawn/Garden Attack and Care. Consumer Fact Sheet on Japanese Beetles Control. A Golden Guide - Insect Pest. Golden Press, N.Y., pages 9,13,14,129.

3. Description and Habits of the Japanese Beetles. Controlling The Japanese Beetle - U.S. Department of Agriculture Home and Garden Bulletin No. 159; pages 306.

Evaluations:

A written evaluation at the end of each activity will be required of all participants. Research topics will be selected at the end of this laboratory/lesson plan.

The activity will extend into the summer months, since the fourth stage of the Japanese Beetle develops at the beginning of summer. Green plants, leaves, roses, and lawns are necessary for feeding at the fourth developmental stage. The fourth developmental stage represents the adult Japanese Beetle.

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EXPENDITURES FOR GIFTED AND TALENTED MINIGRANT

VENDOR	VOUCHER NO.	DATE PAID	AMOUNT PAID
AGRICULTURE EXTENSION SERVICE	39907	12/03/80	$ 38.25
NORTH HILLS BOOK & STATIONERY	40331	12/31/80	78.57
WILLS BOOK STORE	40332	12/31/80	38.91
WILLS BOOK STORE	40332	12/31/80	91.26
WITHERSPOON ROSE CULTURE	40333	12/31/80	25.06
WITHERSPOON ROSE CULTURE	40333	12/31/80	119.55
BARNES SUPPLY COMPANY INC.	40334	12/31/80	274.74
STONE'S SOUTHERN SCHOOL SUPPLY	40337	12/31/80	142.87
TOTAL EXPENDITURES			$809.21

TREASURE ALONG THE NANTAHALA RIVER

Katherine K. McGrady
Wilkes County Public Schools

I. Introduction:

This unit of study is built around a one day field trip to the Nantahala Outdoor Center.* The unit is designed to be used with a tenth grade gifted and talented biology class. The curriculum was developed as a part of an ecological investigation of the Appalachian mountain area. An interdisciplinary approach to learning will be used. Areas of study will include biology, history, language arts, art, and physical education.

II. Purpose:

The overall purpose of this unit is for students to experience and discover natural and historical "treasure" in the area of the Nantahala River. Excitement and awareness of nature will be generated upon which understanding and appreciation of good conservation practices will develop. This understanding and appreciation should make the students more productive members of society.

In order to accomplish this overall purpose, activities which will develop right brain use will be emphasized. Research has shown that it is the right side of the brain that is in command of thought processes involving synthesis, intuition, creativity, perception, analogy, and divergent thinking.

The right brain —the artist, the dreamer— goes largely untaught in our school systems today. This unit will be doing a small part to begin to correct this situation.

III. Objectives:

At the completion of this unit the students will:

1. Realize a sense of fun, adventure, and comradeship as a result of working together to accomplish activities.
2. Appreciate the unique biological significance of the Nantahala River area.
3. Show increased awareness of the importance of biological knowledge in everyday living and understand how biology is related to many disciplines of their curriculum.
4. Gain new insights into the personalities and talents of others involved in the study.
5. Recognize their own ability to accomplish certain tasks or activities that they have never tried before, as evidenced by white water rafting, analyzing water samples, and preparing a video tape presentation.
6. Learn to distinguish right and left brain thought patterns.
7. Consistently demonstrate their appreciation of good environmental conservation practices.

IV. Plan of Action:

This unit will be accomplished over a seven week period! four weeks for introductory activities, one day for the field trip and three weeks for follow up or culminating activities. For the most ideal time for plant study of spring wildflowers and suitable temperature for water activities, the field trip needs to be set for mid to late May.

* For additional information contact Nantahala Outdoor Center, Star Rt., Box 68, Bryson City, N. C. 28713 (704) 488-2175.

Listed below are some of the activities to be accomplished as part of the teaching unit.

Introductory Activities: These activities are to be accomplished prior to the Nantahala Outdoor Center field trip.

1. Joint meeting with parents and students to introduce the unit and discuss the field trip.
2. Students will become familiar with right brain thought processes through independent research, teacher lecture, and the use of a guest speaker. Activities emphasizing right brain development will be directed by the guest speaker.
3. Through research, students will become aware of the correlation between the history and the cultural development that has occurred in the Appalachian mountain area.
4. After collecting information about many of the plants that will be found along the Nantahala River, a visit will be made to a local store that deals in the buying and selling of herbs for food or for their medicinal use.
5. Lab procedures for a forest basal area count and for water analysis will be learned for future use.
6. After a review of Mary Jackson's book How Does Your Garden Grow?, students will be asked to select a favorite wildflower and draw, name, and caption their own creative design.

Activities accomplished during the field trip to the Nantahala Outdoor Center:

1. Students will hike a portion of the Appalachian trail (4 miles) that runs near the Nantahala River. While hiking students will be asked to observe and collect information. To aid students in this activity a scavenger hunt has been prepared.
2. Students will collect water samples and data from a forest basal area lab for later analysis and interpretation.
3. Students will be stationed along the Appalachian trail so they are not in sight of each other. The students will be left alone for thirty minutes. During this time they will be asked to observe their surroundings and to write a short paper on "Nature Awareness".
4. Students will take an eight mile (3 hour) raft trip down the Nantahala River.

Culminating Activities:

1. Students will complete a water analysis lab from water samples collected from the Nantahala River. Data from this lab will be used to explain ecology of the river and to predict future ecological relationships.
2. Students will be asked to bring in plant parts (leaves, roots, flowers, fruits) that they wish to use as natural dyes. Students will dye yarn to be used in a project or display of their own design.
3. After showing the film,"A Delicate Balance", ask students to draw a cartoon that would emphasize environmental concerns.
4. Compile and analyze data collected from basal area lab.
5. Ask students to find examples of both good and bad environmental conservation practices in the community.
6. Ask students to write a short paper on changes in their attitudes that have occurred as a result of this unit.
7. Students will prepare a video tape presentation to explain

objectives and content of this unit to their parents.

8. Students will prepare a notebook which will include all work done in preparation for the field trip, the field trip itself, and all follow-up work.

V. Evaluation:

Students will receive daily grades on class activities. These grades will be based on student participation and accomplishment of tasks or activities, written assignments, oral responses and evidence of good laboratory skills. Major grades will be given on work involving the video tape presentation, the notebook, and an essay type test. The work done on the field trip will also be considered a major grade. The affective objectives of this unit will be evaluated by subjective evaluation of the teacher, student self-evaluation, by observing changes in self concepts, and by observing changes in behavior. At the culmination of the unit each student will evaluate the accomplishment of the objectives of this study.